

How effective are the use of lollipop sticks as a strategy of assessment for learning in key stage 2?

	Targed/Target	Yr hyn yr wyf wedi'i wneud yn yr aseiniad hwn. What I have done in this assignment.
Targed/Target 1	Consider developing counter arguments further	I have acknowledged that this is one of my previous targets, so I have remembered to develop by counter arguments further.
Targed/Target 2	Ensure you synthesise and reflect	I have developed use of synthesis when writing academically by ensuring that I have increased by level of research prior to starting the assignment.
Targed/Target 3	Proofread your work	I have ensured that I have proofread my assignment prior to submission.

The aim of the following research task is to analyse the impact of using the lollipop stick method as an assessment for learning strategy, evaluating its affect upon children's engagement within the classroom. The following investigation will include three observations, each in the form of a lesson study, with a post observation interview of children for each study.

The purpose of this report is to test theoretical perspectives regarding assessment for learning strategies that have been discussed in university and explored during the first professional teaching experience placement. During the initial placement of the Nursery/ Reception class in the current school, I had already introduced the method of using lollipop sticks in the classroom and was interested in looking deeper into this method to see whether it would be just as effective in a mixed year 4 and 5 class.

In collaboration, my team and I decided that we would undertake the lesson study observations in the mixed year 4/5 class as we had all experienced teaching the year 4 children within the school as thought that this was an advantage for us all. The current year 4/5 class has 31 pupils with 23% of children being classed as low ability, 42% of the children describes as being middle ability and 36% of the children being noted as high ability. When proposing the research question for the assignment, my partners and I discussed the range of abilities in the class and decided that we would focus on one child from each ability level for each lesson study depending if we had enough consent forms returned to the school. We received numerous consent forms back from the parents/carers, where we then separated the forms into the ability groupings and chose one from each group at random. Now that we had a record of consent from the parents/carers, we then had to gain consent from the children themselves, as a team we informally spoke to each child individually asking if they would like to be apart of our research. As each child agreed to participate in the study, we began to organise our planning ready for each lesson study.

Literature Review

The element of assessment has always been an integral part of education though there is an on going debate as to which type of assessment is the most beneficial as a means of recording children's learning (Burke, 2010). As Gardener (2012) notes, the debate between whether summative assessment provides a more accurate representation of children's learning compared to the results gathered through formative assessment is a constant conflicting argument. Taras (2005) describes summative assessment as the 'final' result of a learning process. Burke (2010) also notes that summative assessment is an overall judgement that produces a final report. In comparison, Gardener (2012) writes that formative assessment is an ongoing process that provides continuous feedback, informing teachers where the children's current understanding lies and helps teachers to plan where to do next (Sadler, 1998). The Assessment Reform Group (1998) notes many research-based references points of how to develop their assessment for learning strategy. These include: effective planning, focusing on how students learn, assessment is sensitive and constructive, promotes an understanding of success criteria, helps learners to improve, develops their self-assessment skills, recognises all of their achievement and increases the learners motivation to learn (Bartlett, 2015).

Black and William (1998) produced the 'Inside the black box' paper where they delve into the impact of formative assessment being used within classrooms. Burke (2010) and Bartlett (2015) both highlight this document as being the initial theory that brought assessment for learning into focus as a crucial element of educational theory. However, Taras (2009) notes that formative assessment theory had already been previously explored by Gagne and Scriven (1967) where they analyse its effectiveness in an evaluation of the curriculum. Moreover, Black and William (1998) highlight that there are four elements that incorporate formative

assessment: quality of questioning, meaningful and purposeful feedback, peer and self-assessment and sharing of success criteria.

Formative assessment also known as assessment for learning is the crux of this research, looking upon its impact on engagement within the classroom. As Holmes (2018) writes, the definition of engagement itself is up for debate, with one definition by Astin (1999) describing it as a measure of the physical effort the student applies to achieve in their academic experience. Whereas, Exeter et al. (2010) notes that the more modern perspective of engagement defines it as being the 'time and energy and resources spent on activities designed to enhance learning' (page 762). Moreover, definitions aside, engagement is a central part of education as Bartlett (2015) writes, the higher the level of engagement in the lesson, the higher the attainment becomes for the student. The notion of developing the use of assessment for learning has a positive effect on children's achievement as a study conducted by William (2018) produced results that display an increase of between 0.4 and 0.7 standard deviations of student's attainment. This is equivalent to a 50 to 70 percent increase of children's engagement thus leading to an increased amount of achievement (William, 2018).

Gurhy (2017) suggest that levels of engagement and wellbeing go hand in hand, with the increase of either element having a knock-on effect on the other. Research conducted by Laevers and Heylen (2003) on involvement and wellbeing proposed the idea that wellbeing and engagement can be measured in a scale known as the Leuven scale. Palaiologou (2019) writes that the Leuven scale is often used when observing children as it offers the researcher an insight into the participants wellbeing levels and well as their engagement. Gurhy (2017) highlights a poignant element with regards to assessment for learning, explaining how research into classroom based formative assessment does not consider the children's perspective. Reading this research lead my team and I to undertake our lesson studies in Key Stage 2 where we would be questioning them on how they felt about an assessment for learning strategy being used within their classroom.

Woods (2016) notes that modern research is moving away from why involvement increases attainment to how, particularly focusing on children's wellbeing and socio-economic status as influencers. Nevertheless, with wellbeing currently being a pertinent part of pedagogical principles, this research task will explore how using lollipop sticks as a form of the questioning branch of Black and William's (1998) proposed strands of assessment for learning. Palaiologou (2019) notes how questioning and moreover, the quality of questions being asked in the classroom lead to better educational attainment. Bartlett (2015) discusses that the process of learning is not a linear experience as each child experiences it differently. Woods (2016) highlights that the implementation of the quality of questioning strand of assessment for learning has helped children to increase their attainment levels as when used effectively, the questions can be differentiated to suit the pupil's ability. This in turn would have a knock-on effect on their engagement and wellbeing as being able to understand and answer questions that are asked, enables the children to become confident in their own learning and understanding (Gurhy, 2017).

Methodology

The research for this study was undertaken in the form of a lesson study. Dudley (2011) describes a lesson study as being a way in which critical reflection can be applied to current styles of teaching. In short, it is a collaborative project where teachers undertake research together in order to identify strengths and improve teaching standards (Greig et al 2015). When conducting this lesson study, there were three student teachers present, meaning that there will be an analysis of three different lessons. Dudley (2011) writes that observations in

the form of a lesson study have been effective in increasing professional development as they enable practitioners to embed pedagogical aspects deeper into their teaching styles.

As there are three of us conducting this study, we decided to look at our previous experience in the placement school to see if there was a method that we could use to benefit us all. We decided that we would undertake our lesson study observations in the mixed year 4/5 class. Student Teacher 1 had previously taught this class at the start of the placement, Student Teacher 2 was currently teaching the class and I was currently teaching a mixed year 3/4 class. As each of us had some experience of teaching year 4's in the school we decided that this was a good opportunity to begin our research.

When completing the ethics form for this assignment, we drafted a letter of consent that was subsequently emailed to the head teacher of the school for them to assess its suitability. When we received confirmation that the letter was suitable to be sent to the parents/carers, we then asked whether we could introduce the research to the class. After a brief discussion with the class teacher, we decided to explain to the class that the three of us will be undertaking some research for university. During this discussion we explained that we would need to interview the children after each of us had taught a lesson in the class. Explaining that we would have a smiley face indicator throughout and that when we were interviewing the children they would be able to turn it to the green indicating that they were comfortable or turn it to the red when they were not comfortable and wanted to stop. We thought that this was a crucial part data collection as even though we were just gauging a show of hands of who would be interested in participation. This method of data collection also showed that children who were willing to give their consent to take part in the project. We then explained to the children that for them to take part in the research project their parents/carers would have to give their permission. The correspondence was then given out that day for the children to take home with a proposed return date of 20th January 2020.

After the proposed return date, we collected the signed consent forms from the class teacher and held a meeting to decide how we were going to sample the children. When first discussing our research question, we queried the possibility of choosing one child from each ability level in the class. With this in mind, we separated the consent forms into the three ability groupings. Each letter from the ability groupings were placed in a bowl and one child from each group was chosen to become participants of our research. As the participants had now been identified, we then began planning our lessons for observation.

During the discussion of planning we debated on teaching the same subject to the class, though we concluded that this would not be fair on the children as they would have three consecutive lessons on the same subject. Moreover, we decided that student teacher 1 would teach numeracy during session 3, I would teach a religious education lesson during session 4 and student teacher 2 would be teaching a geography lesson during session 5. My team and I then discussed where and when we would be interviewing the children after each lesson study. We had asked the head teacher whether we could use the Key Stage 2 library for the day as it was conveniently opposite the class where we were teaching. On having permission to use the library, we devised a plan for two student teachers to undertake the role of a non-participant observer by using the Leuven scale to record the participants engagement and wellbeing whilst the assessment for learning strategy was being implemented. Two student teachers were then to interview each child individually using a school iPad to record the audio. We planned to undertake these interviews in the last 15 minutes of each lesson so that the children's break times were not affected. After each interview has taken place, my team and I would complete an assisted reflective conclusion (ARC) sheet that would help guide the next lesson study. This format of the ARC sheet model is closely linked with Gibbs's (2001)

reflective cycle. For this lesson study we have followed the structure proposed by Pete Dudley (2011) where there are three lesson study cycles.

The strategy of assessment for learning that we were researching is a part of the questioning branch as discussed by Black and William (1998). When discussing the planning of our lessons we decided that the lollipop sticks that we would be using would be the variable that changed through out the research. Student teacher 1 would be purposely putting the lollipop sticks back into the pot when a question had been asked to the child, when I taught I was to ensure that I was leaving the sticks out of the pot and putting them on the desk next to me. Student teacher 2 was to then again, ensure that they kept the sticks out of the pot when a question has been asked. However, Student teacher 2 was to quickly look at the name on each stick before asking a question in order to differentiate the question.

When planning this research project there were many ethical considerations considered including adhering to the British Educational Research Association (BERA, 2018) ethical guidelines for partaking research in education. The first of which was to complete the ethics form, and have it approved by the university's own ethics committee. Completing this form made my team and plan in collaboration about how we were going to do this research project. We noted that we would use pseudonyms for the children's names in adherence to data protection legislation and that any raw data produced will be destroyed when it has been analysed and put into a cryptic fashion. When undertaking the interviews with the children we also thought about how we were going to store the audio recordings in adherence to the guidelines set out by BERA (2018), we ensures that each audio recording was transcribed that day into a word document again with the children's names being coded. The original audio file was then subsequently deleted as it was no longer needed. The transcript of the interviews and the coded Leuven scales were to be stored on a password protected file where only myself and the two other student teachers would have access.

Lesson study 1 – results and analysis

The first lesson study took place during the 3rd session of the day, straight after the children had had their exercise break. At 11.30am, student teacher 1 collected the children from the playground and settled them ready to begin a numeracy lesson. They began by instructing children to get their numeracy books out and to be ready with a white board and pen at the ready. For low ability children, they already know to get their workbooks out and continue to the next page. The student teacher then wrote 5 multiplication questions on the white board and gave the children a few minutes to answer the first question. The student teacher let the children have 3 minutes to answer the first equation on the board. They then used the lollipop sticks to choose someone to share the way that they worked the problem out. In this school they currently use the Singapore Maths framework which focuses on mastery of mathematics.

The first child chosen at random explains that they used the 'bubble method' to get to their answer. The teacher then explains how to use this method on the whiteboard and then uses the lollipop sticks to choose another child and asks how else they could solve the question. The second child chosen is Child A of the study, they explain that they used they split the numbers into hundreds, tens and ones and worked it out that way. They were more than confident when sharing their method to the rest of the class. It is noted on the graph below and in Appendix 10 and 11 that their wellbeing was rated at a 5 for this lesson study. After each child has been asked question their stick with their name on gets put back into the pot.

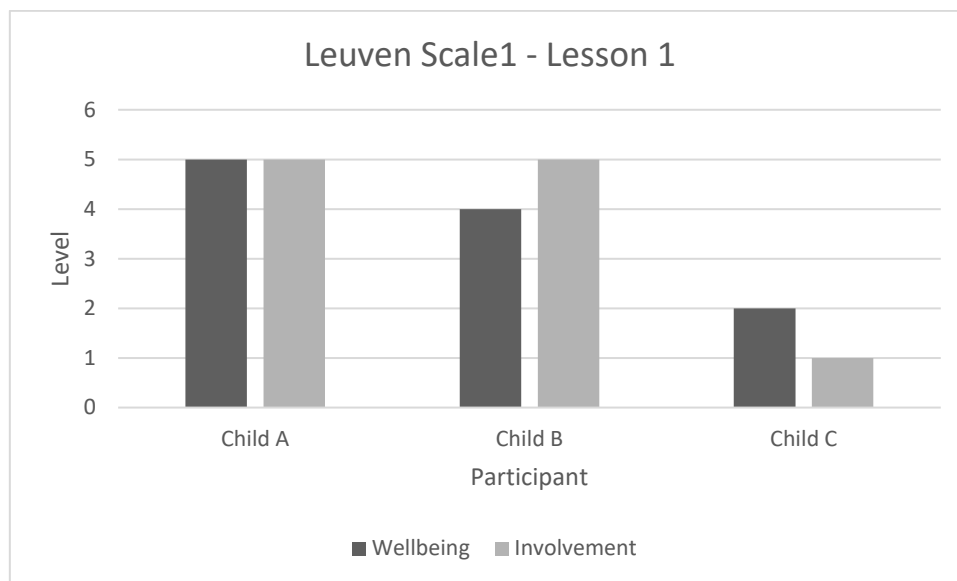


Figure 1.

The teacher then moved onto the second question, again they use the lollipop sticks to choose a child to explain how they reached and answer. The pupil explains that they used the box method to work out the question and talks through the method with the teacher. During this explanation of the method, there is an equation of 2×10 on the whiteboard. The teacher chooses another lollipop stick for someone to answer the question, this time Child C is chosen. Child C is low ability in numeracy and is currently working independently in their workbook. At first, they are confused as to why they are being asked to answer the question and slightly embarrassed with the rest of the class waiting for a response. The teacher offers the aid of using Numicon if it would help them. It was clear to see that Child C felt uncomfortable being asked the question as is reflected in Appendix 10 and 11 with their wellbeing being lower than the other children being observed as well as in their interview in Appendix 16. Although they do give an answer and then turns back to their workbook, ignoring the rest of the class.

The teacher continues to through the list of multiplications on the board, ending up choosing Child B out of the pot. They appear not to be bothered that they name had been chosen and explained their method competently. This is reflected in both Leuven Scale observations that can be seen in Appendix 10 and 11. However in a comparison of Figure 1 and Figure 2, the wellbeing observed for Child B has a slight difference. During the reflection meeting post lesson study, student teacher 2 noted that Child B was becoming increasingly disengaged when their name was not being chosen. As each stick was being placed back in the pot some children were being asked more than once. Child A got asked three times, Child B got asked twice and Child C also got asked three times. It clear to see that in their post observation interviews as seen in Appendix 16, that Child C was very frustrated at being asked numerous times throughout the lesson.

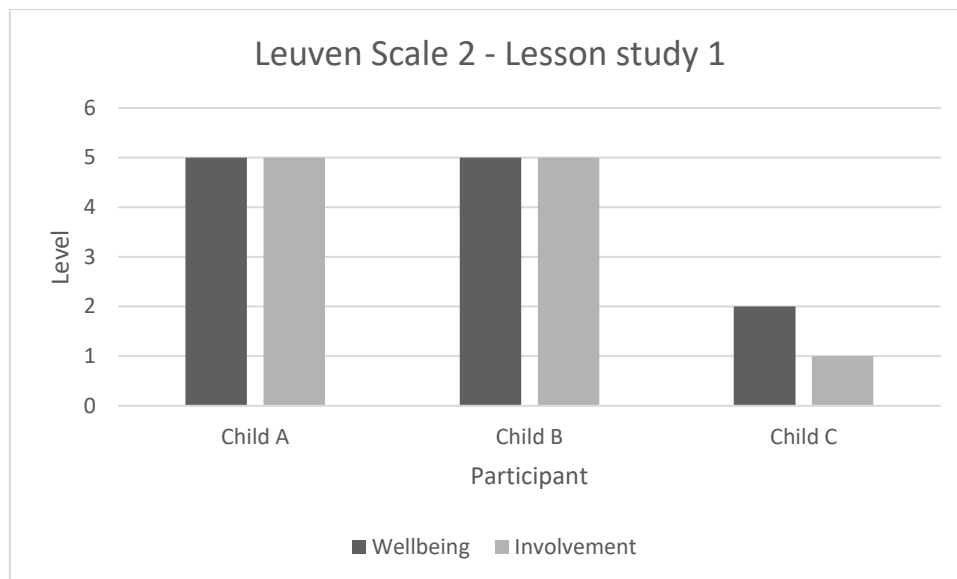


Figure 2.

From this lesson study it is clear to see that the use of lollipop sticks as an assessment for learning strategy is effective, however putting the names back into the pot after each question was not fair on the rest of the class as some children were asked multiple times whereas others were not asked at all. In each interview we asked the children's opinion on whether they thought that putting the sticks back into the pot was fair on the rest of the class and they all agreed that it was.

Lesson Study 2 – Results and Analysis

This lesson study was primarily recapping on previous knowledge from a religious education lesson on Shabbat that took place two weeks prior. Though the recapping of knowledge was necessary to teach the following lesson. The Student teacher taught this lesson during the 4th session of the day commencing at 1.20pm. The teacher used lollipop sticks to ask questions recapping on what they already know about the Jewish celebration of Shabbat. The teacher was mindful in asking the question first, building anticipation and allowing time for the children to think before a name was chosen to answer the question. The variant of this lesson study was to ensure that the lollipop sticks were left out of the pot after a question had been asked, meaning that each child could only be asked one question.

At first the children were excited to see the lollipop sticks being used but as the lesson developed, children who had already answered a question were disengaging with the lesson. In the Leuven Scale results in the graph below (Figure 3) shows how Child A was comfortable throughout scoring 5 for both observations, where as Child B was scoring lower. However, Child C's wellbeing was scored higher during this observation as he felt more comfortable with the subject, this is evident in their interviews in Appendix 16 where they stress their concerns about numeracy. Child B's involvement was scored lower as once they had been asked a question, they were waiting to be asked repeatedly as in Lesson Study 1. However, with the sticks being left out of the pot this time, Child B was beginning to disengage with the lesson.

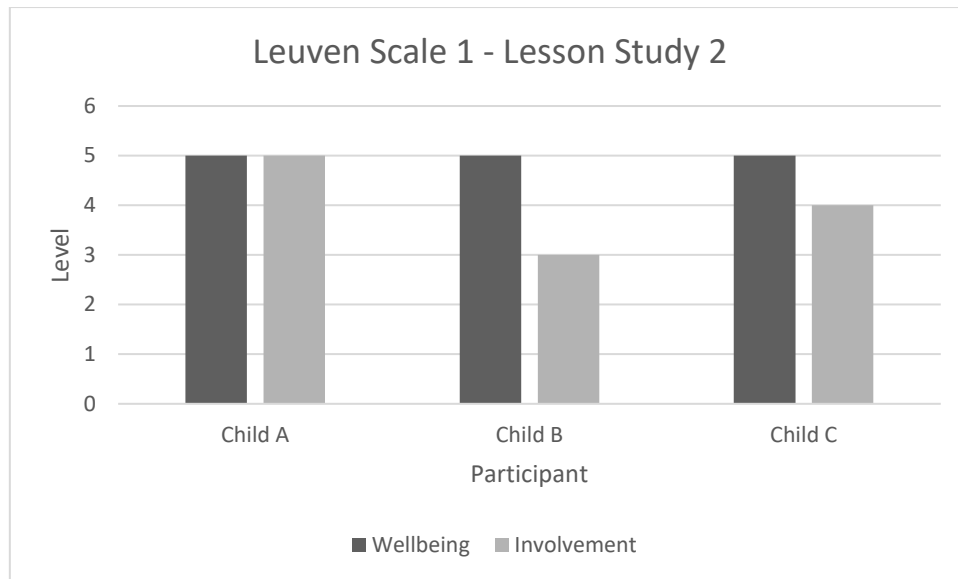


Figure 3.

As the teacher continued using the lollipop sticks to ask questions, one question was directed to a pupil who was not present on the day of the original lesson. The facial expression displayed by the pupil showed that they were embarrassed at being asked the question as they did not know an answer. However, the student teacher had not taught this class before hand and would not have known that they were not present for the previous lesson. Although the child was not a part of the lesson study, it was clear to see that this has an impact upon their wellbeing in the class. However, the teacher then used the lollipop sticks to ask another child if they could explain the question to the pupil who was not present so that they had a better understanding.

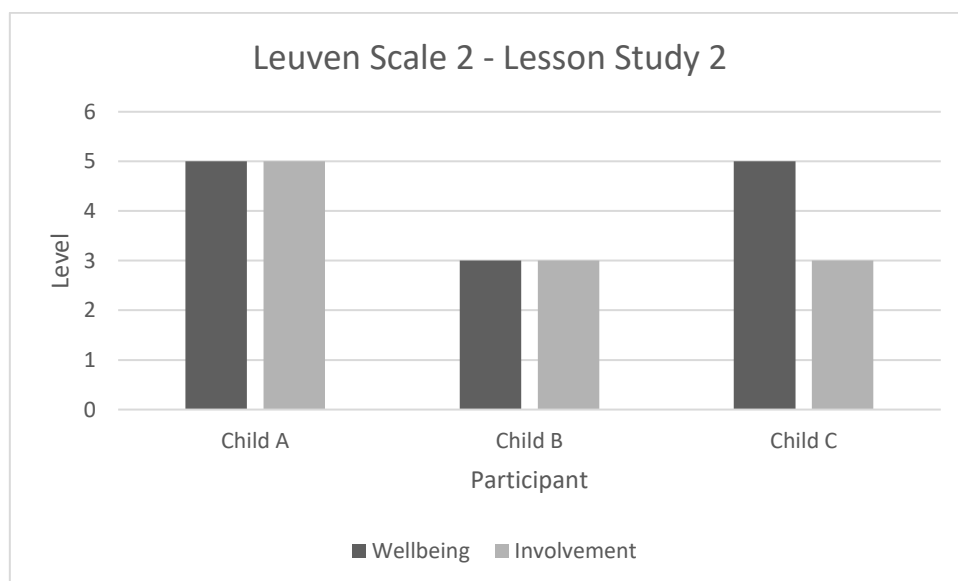


Figure 4.

In a comparison of figure 1 and 4 it is clear to see that the wellbeing and involvement of Child A has remained the same for both lesson studies, however both Child C's Wellbeing and

involvement have increased from those recorded in the initial lesson study. During the post observation interview in Appendix 16, Child B explains that they were not happy during that lesson as their table were not following the instructions of the task fully. They also note that they did not think it was fair that they only got asked one question as they wanted to have another go. In the interview, Child C says that they did not mind the lollipop sticks being used in this lesson as it didn't choose them, they then go on to say that they got to say the easiest thing explaining that they did answer a question. They also mentioned how the use of the lollipop makes them feel saying: 'A little nervous, at least I didn't have to do anything with Maths. Because I'm quite worried with Maths I struggle with it all. Out of all lessons, Maths is the hardest for me anyways.' This statement is evident that they were more comfortable with the questions being asked in this lesson study. Upon conclusion of this lesson study, the method of using lollipop sticks to ask questions is a useful way of assessing children's previously knowledge, provoking them to recall the information. However, the strategy needs to be implemented efficiently throughout all subjects.

Lesson Study 3 – Results and Analysis

This final lesson study took place during the 5th session of the day, starting straight after the afternoon break at 2.30pm. This lesson was a topic lesson on volcanoes that encouraged children to recall previous information. Student teacher 2 began the lesson by using a video to help children recall some of the complex terminology that coincides with the study of volcanoes. After the video was finished the teacher instructed the children to get a blank piece of paper each and explained that they were each going to create a diagram of a volcano. The teacher modelled the outline of each part of a volcano from the inside out, pausing to use the lollipop sticks to ask children questions about volcanoes. The variant for this lesson study was that the teacher would be able to differentiate the questions to the children as they had a better understanding of the children's ability in the classroom, they would still be leaving each stick out of the pot after it had been chosen. They would choose a stick, see the name, think of a question that is suitable and then ask the question to the child. Asking questions in this manner had an impact on children's wellbeing as shown in the Leuven scale results in Appendix 14 and 15 with each child either scoring 4 or 5.

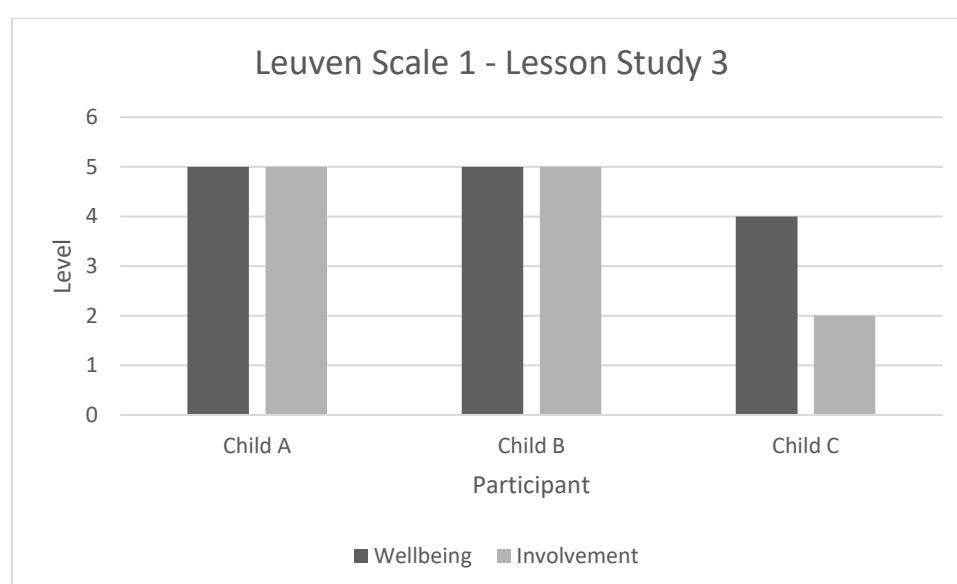


Figure 5.

With regards to the children's involvement for this lesson study, Child C's level has dipped again (as seen in figure 5 above), however in the interview in Appendix 16, Child C explains that they are not happy with the lesson as they are being asked questions when the lesson has not been finished. Although this lesson is like the previous lesson study with the focus on recapping information, these topic lessons were taught before the break over December. They note that it is nice to recap on the information that they had previously studied at the start of the interview explaining that we had 'just dropped' the topic and was nice to learn about the subject again. On the other hand Child A's wellbeing and involvement have dropped in the Leuven Scale graph (as seen below in Figure 6), this could be to the fact that the child had transferred to the school when the teaching of this topic was coming to an end. This would then have a knock-on effect on their ability to have the information to answer the questions as they were not in the school for the entirety of the topic lessons.

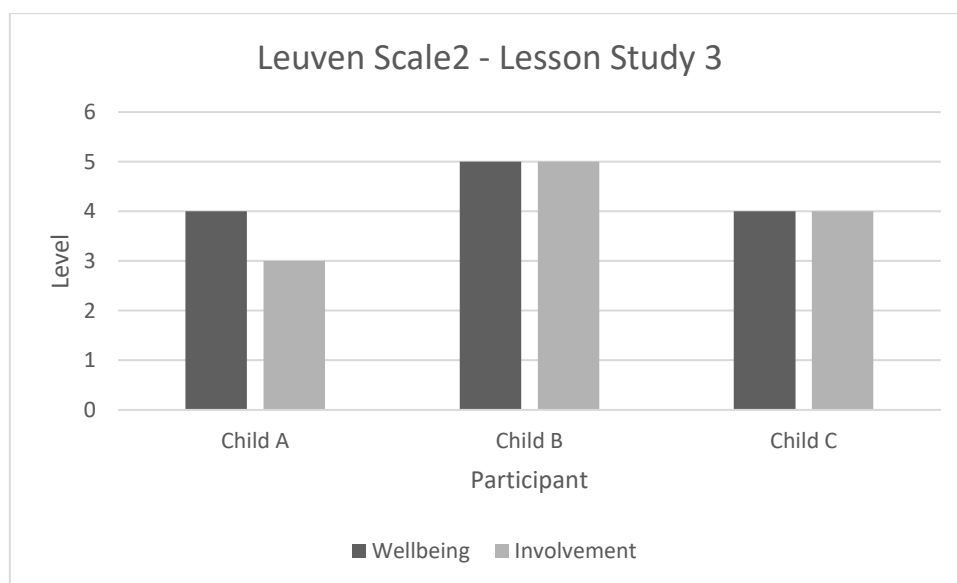


Figure 6.

As noted in the assisted reflective conclusions model in Appendix 9, the use of lollipop sticks as a method for assessment for learning is effective as it has had an impact on the children's wellbeing and involvement even though there have been other anomalies that have had an impact on the levels for each lesson study. Although this method is effective in the classroom, it would be useful to introduce other strategies to ask questions, using a range of different methods so that the children do not become passive in their learning. In the concluding interview we asked the children whether they thought it was fair that we were leaving the lollipop sticks out of the pot. Each child agreed that this was a fair way of using the lollipop sticks, explaining that everyone in the class will then be able to have a turn at answering questions. In the discussion of whether the children would like their teacher to use other methods of asking questions in the interviews, the children mentioned using the random button on Class Dojo, giving children a number each and asking at random that way and using white board to individually display their answers to the teacher. Child C was even able to explain to use that using the random button on Class Dojo was better than using lollipop sticks alone as it is truly at random as the computer is choosing not the teacher. This was an insightful question as it allowed us as researchers to explore what the children would like to see being implemented in the classroom.

Discussion of research findings and research

The finding of this research project suggests that using the lollipop sticks effectively does increase children's wellbeing and involvement. However, putting too much emphasis on this method alone could be detrimental as the children could become complacent with this way of asking questions. As Gardner (2012) notes, questioning is an effective tool of assessment being used within classrooms, however as there are multiple ways of developing these questions to prompt higher order thinking skills, practitioners need to test out different strategies out in order to find out what works best for each class. Palaiologou (2019) supports this statement by writing that not every method of assessment for learning will be effective as others in the classroom. The effectiveness of each method of assessment for learning could even alter between something as minimal as subject or topic, or even the time of day (Holmes, 2018). Burke (2010) further supports this statement by discussing the fact that assessment for learning strategies need to be well suited to each class in order to benefit from its effectiveness in increasing levels of wellbeing and motivation.

With regards to the point highlighted earlier in the literature view, Gurhy (2017) suggests that when assessment is researched, it is rare that the children's perspective of assessment for learning strategies are considered. Throughout this research project, the children's opinion of how each lesson study and what they thought of each variant of the lollipop sticks was a crucial element for the analysis and evaluation of the findings. Gurhy (2017) and Gardner (2012) both highlight the importance of children's wellbeing working in collaboration with their involvement in their education. Therefore, this research has shown that asking the children what they think about the lollipop sticks being used in the classroom helps further increase their involvement. As Palaiologou (2019) writes, the use of pupil voice has shown that it increases children's wellbeing and involvement, by knowing that their opinions and voice is valued and acted upon, leads to an overall increase in their engagement in education. The results showed an overall increase in engagement throughout the three lesson studies. However, these results do not reflect the full impact introduction the lollipop stick method to the class as other children took to the method quickly whereas other children were clearly apprehensive about this new questioning strategy. It is evident that the introduction and implementation of this method impacted on the children's wellbeing and involvement throughout the studies, the observations proved to be useful when testing out the variant change in how we would use the lollipop sticks, showing how children were more engaged when the lollipop sticks were replaced back in, knowing that they could be asked another question at any time. Moreover, as Child C notes in their interview, they thought that leaving the sticks out of the pot after being chosen was the fairest way to use this method as this way ensured everyone would be asked at least one question.

Conclusion

Upon conclusion, in response to the proposed research question, the use of lollipop sticks does have an influence on children's engagement in Key Stage 2, however how and when the lollipop sticks are used and implemented impinges on the level of effectiveness. As noted throughout the findings, the method of using lollipop sticks to ask questions needs to be well implemented into the classroom environment, with arguably the teacher being able to differentiate questions to the children not to have a detrimental effect on their wellbeing. The

analysis of this research provided us with an insight to what the children thought could be introduced into their class as a means of questioning. It was interesting to see the children suggesting other methods of assessment for learning such as using whiteboards, using the random button on Class Dojo and even giving each child a number and calling them at random. It is obvious that they have already been exposed to these methods of assessment for learning previously in their education. Moreover, the lollipop stick method should not be the only method being used in the classroom. As Taras (2009) writes, other assessment for learning strategies should be embedded across the deliverance of the curriculum in order to reflect the suggestions proposed by Black and William (1998). This point is echoed in the Successful Futures written by Donaldson (2015) as assessment for learning is one of the twelve key pedagogical principles highlighted in the prospective curriculum for Wales.

When conducting this research project there were some limitations faced, the first of which being that we only had two days off the teaching timetable to be able to plan, conduct and reflect upon the findings. In short, we only saw a 'snapshot' of the classroom during the lesson study observations. This would raise the question that if were to observe the lollipop stick method being implemented over a longer period, would this have any impact on the results and analysis of the research. The second limitation we encountered was that we did not pilot this research before beginning the study. Holt and Walker (2009) suggest that piloting research prior to beginning the project produces a baseline for the research, enabling the researchers to have something to compare the analysis of the results. Thompson and Thompson (2008) would argue that having a baseline for research would guide the reflection throughout the whole project. Furthermore, a strength to this lesson study-based research was that the children were motivated throughout as they were eager to participate in the report even when they had the right to withdraw at any given time.

Upon analysis of the research methods, the use of non-participant research was beneficial in these observations as it meant that the student teachers did not interfere with the lesson study (Meadows, 1983) and (Clough and Nutbrown, 2012). The Hawthorne effect was minimal during the lesson study observations as the children were familiar with each student teacher as Paradis and Sutkin (2011, p. 70) suggests, having already developed a positive relationship with the observer, reduces the Hawthorne effect to the bare minimum. Therefore, the use of the lesson study method of observation was useful in answering the proposed research question.

Recommendations

If I were to undertake this research again, a recommendation would be to use the lesson study method again as a form of observation. This research has shown how useful it is to observe how other teachers implement elements of assessment for learning differently into their individual teaching styles. However, I would do a pilot first in order to have a baseline of results to aid in the analysis and evaluation of the result. As briefly mentioned earlier, I would also undertake this research over a longer period to be able to observe the full effect of the implementations of assessment for learning strategies. As mentioned in the conclusion, with assessment for learning being one of the twelve pedagogical principles in the curriculum 2022 in Wales Donaldson (2015), it is crucial that practitioners begin to introduce and test out different elements of assessment for learning from each branch highlighted by Black and William (1998) to be able to effectively benefit from its use.

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